

***European Aviation Safety Agency***

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**Comment Response Document (CRD)  
on Consultation paper nr. 6 of 29 July 2003**

**CS-P  
Certification Specifications for Propellers**

## **Foreword to the Comment Response document (CRD)**

To give a rapid overview of the CRD, the following keywords were used in responding to comments:

- “Carried”: The proposed amendment is wholly transferred to the revised text.
- “Noted”: The comment is acknowledged and where needed the text has been improved.
- “Deferred”: The comment requires further assessment by the Agency under its future rulemaking programme.
- “Disagreed”: The comment is not shared by the Agency.

## General Comments

Para.

### 30 / Europe Air Sports

#### Comment

Refer to Europe Air Sports document S3049 dated 9 September 2003, attached.  
In CS P, dated 22.07.2003, page 6 and page 27, delete in the headline the words "sailplanes or" to read:  
Section E : Propeller for Very Light Aeroplanes.

#### Response

Disagreed.  
It should be noted that Section E was decided to be removed from CS-E.

### 30 / Europe Air Sports

#### Comment

It is the intention of Core-Group 10 to transfer the requirements for propellers in JAR-22 Subpart J to CS-P. According to the Explanatory Memorandum the agency will make the decision on the final location of these requirements after getting all the comments.

Europe Air Sports endorses strongly the recommendation of the Recreational Aviation Steering Group (RASG) as written down in attachment one, Explanatory Memorandum to CS 22 p[age 6. In paragraph 5 the statements by Core Group 9 and 11 recommend to keep the engine and propeller requirements in CS 22 and leave them out of CS P and CS E.

It is of the greatest concern to Europe Air Sports if JAR-22 is split up into various documents in the EASA domain. JAR-22 has been a very comprehensive document where the requirements for gliders are well interconnected.

Europe Air Sports finds that the actual technical requirements for propellers (and engines) prove a satisfactory level of safety as they are today.

The powered sailplane is a glider. If something is wrong with the propeller, it is still a glider, hence we do not need the same requirements as for powered aircraft, but a very simple installation and simple management of the engine and propeller.

Some of the big differences to other aircraft is the weight-span problem of sailplanes, the need of "soarability" and the way of using them like landing in a field. This leads to special and sometimes lower requirements in order to maintain the present level of safety within gliding. This is an important argument to have the requirements for the propellers together with the rest of the requirements.

We are especially concerned, that being put in CS-E and CS-P the requirements will be influenced in future by the requirements for other aircraft developed by non-glider experts.

Therefore Europe Air Sports strongly recommends the Agency to have all glider requirements such as for the propellers are put together in CS-22 and not split out over CS-22 and CS-E and CS-P.

[...] appreciates the opportunity to comment on the draft CS-P rules and will be ready any time to elaborate on their arguments,

#### Response

Noted.  
During the consultation for CS-E, CS-P, CS-22, CS-VLA, CS-VLR, the views of the commentators were requested on what is the most appropriate location for the certification specifications to be used for engine and propeller to be installed on powered sailplanes, very light aeroplanes (VLA) and very light rotorcraft (VLR)

The following points should be kept in mind:

The Basic Regulation 1592/2002 requires all products to have a Type Certificate. Engine and propeller of whatever size or design, are defined in the Regulation as products.

It is clear that the levels of safety intended by the current JAR-E (CS-E is based on JAR-E plus CS-22 subpart H plus appendix B of JAR-VLR) are higher than that intended by the engine requirements in JAR-22 and JAR-VLR (Used as the basis for CS-22 and CS-VLR).

It is important both that the Agency maintains this principle of the level of regulation being appropriate to the intended use of the product, and that this is clear to all interested parties.

It is important that the location of the requirements (whether in CS-E or CS-22 etc.) should not affect in any way the rigor with which compliance is both demonstrated and found.

Two solutions were offered:

- 1) To place such certification specifications in the certification specifications for engines (CS-E) and certification specifications for propellers (CS-P) (Consistency of engine and propeller texts being the main rationale).
- 2) To place such certification specifications in the aircraft certification specifications either directly (CS-22 and CS-VLR) or by cross-reference (CS-VLA) (Use of an aircraft system approach being the main rationale).

It should be noted that the issue was only related to the location : the texts were technically unchanged (only editorial changes).

A careful review of received comments does not show a clear majority in favour of one or the other solution. Both Authorities and Interested Parties are divided on the issue.

## General Comments

### Para.

To find a solution for the first issue of all CS, the following was agreed:

-Solution 2 should be adopted because it complies with the general principle of transformation of JARs into CS (avoiding changes). Currently, the engine and propeller certification specifications for powered sailplane, VLA and VLR are included directly or by cross-reference in the corresponding JAR.

-However, the appendix B of JAR-VLR should be replaced by the corresponding text that was included into the draft CS-E circulated for comments. The latter is considered more adequate as specifications for a separate engine certification (imposed by EU Regulation 1592 and Part 21), avoiding the confusing numerous cross references to aircraft specifications.

-Finally the Agency should consider, at an appropriate time, a review of the situation. The present decision was taken under time pressure and following a short consultation, dictated by the need to have the EASA operational on September 28.

### 40 / ACG

#### Comment

CS-P is acceptable for ACG.

#### Response

Noted.

### 44 / CAA Sweden

#### Comment

With reference to the Consultation Papers concerning certification specifications (CS) mentioned above, we would like to make the following comments.

Since the proposed certification specifications contain regulatory material which, essentially, is identical to the content of the corresponding JARs, we are in favour of the proposed material.

However, should the proposals not have the same content as those JARs, there must be a possibility to rediscuss such items.

#### Response

Noted.

Further review may be carried out by the Agency. However, it should be noted that all technical texts have been published by the JAA in accordance with JAR-11 for the standard 3 month comment period. All interested parties had the opportunity to provide comments. The Agency may decide to provide extra time for interested parties to react after publication of the decision.

### 49 / CAA UK

#### Comment

Please be advised that the UK CAA has no comments to make on CS-P 'Certification Specifications for Propellers.' The document is satisfactory as written.

#### Response

Noted.

### 54 / JAA RST

#### Comment

On 10-11 September the JAA Regulation Sectorial Team (RST) was discussing the recommendation to be made to the JAA Committee relative to the adoption of NPA P-3. Written comments from the FAA led the RST to return the NPA to the Sponsor requesting him to review the FAA comments and discuss them with FAA.

As NPA P-3 is part of the proposed CS-P the RST wishes to make its decision known to the reviewers of the CS. The comments received from FAA are in the attachment to this Comment Form.

FAA Comments to Draft Final Rule NPA P-3, Complete revision of JAR-P Section 1

Formal comments were submitted on NPA-P-3 in June of 2002. Some of these comments were adopted and some were not within the current Draft Final NPA-P-3. In addition some requirements within the current Draft Final NPA-P-3 have been altered such that they differ from the original NPA-P-3 and from FAA comments. Comments on the current Draft Final NPA-P-3 are summarized below

#### Response

(FF) NPA P-3 is the result of the harmonisation with FAR-Part 35 and has been worldwide circulated in the JAA system. The FAA comments received at that time have been carefully reviewed and taken into consideration as appropriate. The currently published JAR-P is totally out of date compared to the NPA P-3 and to the new FAR Part 35. It should be noted that the FAA has stopped the discussion for harmonisation. It is recommended to base this CS-P on NPA P-3.

### 68 / FAA USA

#### Comment

The Federal Aviation Administration (FAA) has provided comments on previous versions of the Certification Requirements for Propellers. These include NPA-P 3, and draft versions of JAR-P and CS-P. Some of the comments have been adopted and some have not. At this point in time it is assumed that the requirements previously recommended for deletion will be adopted in some form into the CS-P. Therefore, comments will be provided for these requirements even though the overall recommendation is that they not be adopted at this time. These requirements include:

## General Comments

### Para.

CS-P 160 Critical Parts Integrity - It is recommended that this requirement not be adopted until Authority and Industry consensus be reached. This requirement has not received adequate review by the Propeller Harmonization Working Group.

CS-P 560 Flight Functional Tests - It is the opinion of the FAA that this requirement is adequately covered by the requirements contained within parts 23 and 25.

Also, it is recommended that the exemptions for fixed pitch wood propeller of conventional design contained in NPA-P 3 be reinstated in the requirements or that advisory material be developed that reinstates these exemptions.

### Response

CS-P 160

Disagreed. CS-P has been based on NPA-P 3. This NPA has introduced in Section 1 of JAR-P rules for critical parts reflecting ACJ-P 70(e)(2) of JAR-P change 7. These rules have been further improved in NPA-P 9 which was circulated by JAA for comments by industry and authorities. NPA-P-9 will be included in the JAA "inventory" delivered to the Agency for further consideration. The Propeller Harmonisation Group was dismantled several years ago at the request of FAA.

CS-P 560

Deferred. Keep the text as proposed. It is up to the Agency to define its policy. Some day FAR 25/23 might contain these requirements from CS-P. The decision will be to either keep them in CS-P or to move them to CS-25/23.

Because CS-P has been written in terms of safety objectives, it is felt that there is no need to exempt fixed pitch wood propeller of conventional design from the safety objectives of CS-P. The real debate is on the appropriate means of compliance

## B1 - SECT A - CS-P 10

### Para. (b)(2)

68 / FAA USA

#### Comment

The proposed text changes are shown in bold red. (SEE HARDCOPY)

(Proposed different text:)

(2) When compliance with only Section E has been demonstrated. The Propeller must then be restricted to installations in powered sailplanes or very light aeroplanes, [this shall be stated in the propeller Type Certificate Data Sheet.]

The Type Certificate Data Sheet should state that this class of propellers is restricted to powered sailplanes or very light aeroplanes. Otherwise there is no clear indication that the propeller did not meet the much more stringent requirements of Sections A,B, and C.

#### Response

Noted. It should be noted that Section E has been cancelled and that these specifications are in CS-22.

## B1 - SECT A - CS-P 20

### Para. (a)

68 / FAA USA

#### Comment

The proposed text changes are shown in bold red. (SEE HARDCOPY)

(Proposed different text:)

(a) The applicant shall provide a list of all the components, including references to the relevant drawings and software design data, which define the Type Design of the Propeller.

The sentence structure proposed in CS-P 20(a) is confused. Revert to the version proposed in NPA P-3.

#### Response

Noted. Procedures for applicants are governed by Part 21.

Text now reads as follows:

"The list of all the parts and equipment, including [...] of the propeller, must be established."

**B1 - SECT A - CS-P 50**

**Para. (b)(2)**

**54 / JAA RST**

**Comment**

The FAA suggests the following wording changes:

JAR-P 50(b)(2)

There are no design or test requirements that establish maximum torque. Therefore, the value should not be a required rating or operating limit. Also, in accordance with (b)(iii) the applicant could request this limit if appropriate.

(2) Maximum torque. (to be deleted)

(3) Over-speed and over-torque limits. (to be renumbered as 2)

**Response**

Disagreed. The reference to maximum torque has been kept. It is the understanding that torque is a limit for a propeller. It is referred to in JAR-P 560. There is also a question of logic: in order to have over-torque limits, a torque limit must first be defined.

**B1 - SECT A - CS-P 70**

**Para. (b)**

**54 / JAA RST**

**Comment**

JAR-P 70 (b)

The FAA does not concur with JAR-P 70(b). Development testing is done out side of the control of the Authority oversight and therefore should not be included in the certification requirements for the propeller. The intent of this requirement is also contained in JAR 21.21. Therefore, (b) is a redundant requirement. The paragraph should be deleted.

**Response**

Disagreed. This is a means to implement a Part 21-requirement during propeller certification. It is a useful reminder to both the authority and the applicant. This CS-P 70(b) does not make the development testing part of certification. It simply provides the means to address the failures which occurred during development and which must be corrected before certification.

**B1 - SECT B - CS-P 150**

**Para. (a)(1)**

**54 / JAA RST**

**Comment**

JAR-P 150(a)(1)

The word effect is too broad for use in the requirement especially when used as a plural. The phrase likely consequence has a history of use. It is currently used in JAR-P 70 Failure analysis and therefore the interpretation has been established. A change to the word "effects" implies that something different is being requested when this was not the intent.

(a) (1) An analysis of the Propeller must be carried out to assess [likely consequence] of each failure condition under stated aircraft operating and environmental conditions. This analysis will consider -

**Response**

Disagreed. There is a requirement to identify hazardous, major, minor propeller effects. Therefore the use of the word 'effects' in CS-P 150 (a)(1) is consistent.

**Para. (c)**

**54 / JAA RST**

**Comment**

JAR-P 150 ©

Add Propeller to Critical Parts. The requirement is only applicable to Propeller parts.

(c) It is recognised that the probability of primary failures of certain single elements (for example, blades) cannot be sensibly estimated in numerical terms. If the failure of such elements is likely to result in Hazardous Propeller Effects, they will be identified as [Propeller] Critical Parts and reliance must be placed on meeting the prescribed integrity requirements of JAR-P 160. These instances must be stated in the safety analysis.

**Response**

Carried.

**B1 - SECT B - CS-P 150**

**Para. (g)(1)**

**54 / JAA RST**

**Comment**

JAR-P 150(g)(1)

The FAA does not concur with the changes to Hazardous Propeller Effects. A significant overspeed of the propeller and unintended movement of the propeller blades below the established minimum in-flight low-pitch position are well established Hazardous Propeller Effects. These conditions are currently included in JAR-P Change 7 JAR-P 70 Failure Analysis. The known consequences associated with the proposed (i) and (vi) has been established accidents such as the EMB-120 accident, NTSB Event Id: 20001212X16773, Date: 04/05/1991 State: GA City: BRUNSWICK. CAUSE REPORT: "The loss of control in flight as a result of a malfunction of the left engine propeller control unit which allowed the propeller blade angles to go below the flight idle position."

(Proposed different text:)

(1) The following are regarded as Hazardous Propeller Effects -

- (i) A significant overspeed of the propeller.
- (ii) The development of excessive drag.
- (iii) A significant thrust in the opposite direction to that commanded by the pilot.
- (iviii) A release of the Propeller or any major portion of the Propeller.
- (iv) A failure that results in excessive unbalance.
- (vi) Unintended movement of the propeller blades below the established minimum in-flight low-pitch position.

**Response**

Deferred. This subject of the propeller safety analysis is addressed by means of NPA P-7 which has been circulated worldwide for comments. This NPA will be delivered to EASA for further consideration. As a consequence the FAA comment will be considered by the Agency in due time.

**Para. (g)(2)**

**54 / JAA RST**

**Comment**

JAR-P 150(g)(2)

The FAA does not concur with the changes to Major Propeller Effects. The word "significant" was added into the Major Propeller Effects definitions (iii) and (iv). A governing propeller typically dithers on a set point. These small changes in pitch, torque, and speed are not significant but would violate the proposed definition because they are uncommanded and uncontrollable.

(Proposed different text:)

(2) The following are regarded as Major Propeller Effects -

- (i) An inability to feather the Propeller (for feathering Propellers).
- (ii) An inability to change Propeller pitch when commanded.
- (iii) A significant uncommanded change in pitch.
- (iv) A significant uncontrollable torque or speed fluctuation.

**Response**

Deferred. This subject of the propeller safety analysis is addressed by means of NPA P-7 which has been circulated worldwide for comments. This NPA will be delivered to EASA for further consideration. As a consequence the FAA comment will be considered by the Agency in due time.

**B1 - SECT B - CS-P 160**

**Para. (b)**

**54 / JAA RST**

**Comment**

JAR-P 160(b)

(Proposed different text:)

The manufacturing plan should contain any necessary inspections.

(b) A manufacturing plan which defines the method of manufacture -

**Response**

Deferred. This subject of propeller critical parts has been addressed in NPA P-9. which has been circulated worldwide for comments. This NPA will be delivered to EASA for further consideration. As a consequence the FAA comment will be considered by the Agency in due time.

**B1 - SECT B - CS-P 160**

**Para. (c)**

**54 / JAA RST**

**Comment**

The FAA suggests the following wording changes:

JAR-P 160 (c)

Add Propeller to Critical Parts. The requirement is only applicable to Propeller parts.

(c) The manufacturer must demonstrate that adequate procedures are adopted to ensure the necessary control of the engineering and manufacturing functions associated with the production of [Propeller] Critical Parts.

**Response**

Carried.

**Para. (d)**

**54 / JAA RST**

**Comment**

JAR-P 160(d)

The FAA does not concur with JAR-P 160(d.). This requires the type certificate holder (TC) to control maintenance and overhaul of critical parts. This is beyond the control of the TC holder. The TC holder only has control over the documentation for maintenance and overhaul of critical parts. Therefore, the following text should be introduced.

(d) A service management plan which defines in-service processes for maintenance and repair of Propeller Critical Parts which will maintain attributes consistent with those required by the engineering plan.

**Response**

Deferred. This subject of propeller critical parts has been addressed in NPA P-9 which has been circulated worldwide for comments. This NPA will be delivered to EASA for further consideration. As a consequence the FAA comment will be considered by the Agency in due time.

**B1 - SECT B - CS-P 170**

**Para. (b)**

**54 / JAA RST**

**Comment**

JAR-P 170(b)

This change from the requirement proposed in NPA P-3 will only serve to produce a list of materials. The intent should be for the materials to conform to acceptable specifications. The list of materials is already part of the type design. Restore the original text in NPA P-3

(To be deleted:)

(b) The Applicant must identify all materials used in the Propeller, together with associated specifications and processes, and all manufacturing methods which will be part of the Type Design (To be deleted and replaced by:)

(Proposed different text:)

"(b) All materials and manufacturing methods must conform to acceptable specifications."

**Response**

Disagreed. Wordings are consistent with the Essential Requirements of the Basic Regulation, in particular paragraph 1.b.2.. The intent is to have a formal identification of all materials.

**B1 - SECT B - CS-P 220**

**Para. (d)**

**54 / JAA RST**

**Comment**

JAR-P 220(d)

It is assumed that this requirement is to address start locks which are rotational speed dependent not airspeed dependent. Also, this documentation should be in the Installation Manual not the Type Certificate Data Sheet.

(d) Where there is a minimum Engine/Propeller rotational speed [ ] below which Propeller feathering cannot be accomplished (e.g. certain Propeller Systems for light aircraft) the Propeller [Installation Manual] must be endorsed accordingly.

**Response**

Noted. The intent is to have it in the TCDS, which is part of the type-certificate. Changes to the type-certificate are controlled under Subparts D and E of Part 21. The propeller manuals are not controlled in the same manner. Rotational speed and air speed both affect the forces acting on the propeller. However, the word "and" now reads "and/or".

**B1 - SECT B - CS-P 240**

Para.

**54 / JAA RST**

Comment

JAR-P 240

The sentence, "If appropriate, due consideration must be given to the effects of any residual stresses." appears to be a carry over from JAR-E 100 and that requirement is specifically restricted to turbine engine critical parts. This would now make the specific engine requirement applicable for all propeller parts mounted on any engine, turbine or reciprocating. The residual stresses are taken into account with the prescribed integrity requirements of JAR-P such as JAR-P 350 and 370. The sentence is advisory and therefore should be deleted as shown below.

(Proposed different text:)

"The maximum stresses developed in the Propeller must not exceed acceptable values considering the particular form of construction and the most severe operating conditions. []"

Response

Disagreed. It is not considered advisory. However, the reference to "if appropriate" will be deleted.

**B1 - SECT C - CS-P 340**

Para. (b)

**54 / JAA RST**

Comment

JAR-P 340(b)

The reporting unscheduled repair of action should be part of the certification documentation. Therefore this should be included as it was in NPA-P 3.

(Proposed different text:)

(b) During all tests, only servicing and minor repairs must be permitted except that Major repairs or replacement of parts may be allowed, provided that the parts in question are subjected to an agreed level of additional testing. [Any unscheduled repair or action on the test article must be recorded and reported.]

Response

Noted. It is sufficient to record.

**B1 - SECT C - CS-P 350**

Para. (b)

**54 / JAA RST**

Comment

JAR-P 350(b)

Testing has shown that a blade is most likely to fail in a transition region. Therefore, the transitions need to be tested not just considered. The original wording in NPA-P-3 should be restored.

(Proposed different text:)

(b) If appropriate, blade features associated with transitions to the retention system [(for example a composite blade bonded to a metallic retention) must be tested either during the test of JAR-P350(a) or in a separate component test.]

Response

Disagreed. Reference to CS-P 350(a) already imposes testing. The policy is to avoid the use of examples in the airworthiness code, in order not to risk limiting the meaning of the text.

**B1 - SECT C - CS-P 360**

Para.

**54 / JAA RST**

Comment

The FAA does not concur with the following:

JAR-P 360

The FAA does not concur with the change introduced to JAR-P 360 that links the bird size to the airplane requirements. This reduces the bird size for part 23 airplanes to 2 lbs. The FAA has always required a 4 lbs. bird strike substantiation for composite propeller blades by means of special conditions. This reduction in bird size will reduce the current level of safety because the resulting failed propeller blade can penetrate the fuselage on multi-engine airplanes and can result in substantial damage due to unbalance on both single and multi-engine airplanes. The FAA has no plans to reduce the bird size to 2 lbs. for composite blades and therefore propellers that meet the JAR-P bird requirement with less than a 4 lbs. bird will not be validated by the FAA. The text originally proposed in NPA-P-3 should remain.

(Proposed different text:)

Except for fixed pitch wood Propellers of conventional design, it must be demonstrated, by tests or analysis based on tests or experience on similar designs, that the Propeller is capable of withstanding the impact of a 1.8 kg bird at the critical location(s) and critical flight conditions of a typical installation without causing a Major or Hazardous Propeller Effect.

Response

Deferred. This would be a bilateral issue between the Agency and the FAA. For the time being, it is considered adequate to have a common bird-threat for all parts of the aircraft, including the propeller, until further review of the safety issues is carried out by the Agency. It must be noted that there was no bird requirement under JAR-P before the last proposed amendment (NPA-P-3).

**B1 - SECT C - CS-P 370**

Para. (a)

**54 / JAA RST**

Comment

JAR-P 370(a)

In general service experience is not sufficient to comply with fatigue requirements. Although, experience should be an option except for fixed pitch wood propellers of conventional design and this can be stated in the advisory material.

(a) A fatigue evaluation of the Propeller must be conducted by tests, or analysis based either on tests [], to show that Hazardous Propeller Effects due to fatigue will be avoided throughout the intended operational life of the Propeller on either

Response

Disagreed. The whole CS-P 370 has been written in order to define safety objectives commensurate with safety analysis processes i.e. qualitative or quantitative. All propellers must achieve the same safety objectives. The means of compliance may be different depending on the design.

Para. (b)(1)

**54 / JAA RST**

Comment

JAR-P 370 (b)(1)

The FAA does not concur with the changes to JAR-P 370 (b)(1). Fatigue failures are the leading cause of propeller related accidents. Therefore, the development of fatigue characteristics should be required not an option when necessary. The only exception to this would be for fixed pitch wood propellers of conventional design and this could be stated in advisory material.

(b) (1) [Fatigue characteristics must be established for:]

Response

Disagreed. All propellers must achieve the same safety objectives. The means of compliance may be different depending on the design.

**B1 - SECT C - CS-P 390**

Para. (a)(1)

**54 / JAA RST**

Comment

JAR-P 390 (a)(1)

Rated rotational speed is not a defined parameter. Takeoff rotational speed is defined and is most applicable to the requirement.

(Proposed different text:)

(1) A 50-hour flight-test in level flight or in climb. The Propeller must be operated at take-off power and rated rotational speed during at least five hours of this flight test, and at not less than 90 percent of the [takeoff ] rotational speed for the remainder of the 50 hours.

Response

Noted. The text will be improved to reflect the intent of the comment. Similarly, CS-P 690 will be reviewed.

**B1 - SECT C - CS-P 390**

**Para. (a)(2)**

**54 / JAA RST**

Comment

JAR-P 390 (a)(2)

Rated rotational speed is not a defined parameter. Takeoff rotational speed is defined and is most applicable to the requirement.

(Proposed different text:)

(2) A 50-hour ground test The Propeller must be operated at takeoff power and [] rotational speed.

Response

Carried. Reference to 'rated' subparagraph (2) will be deleted.

**Para. (c)**

**54 / JAA RST**

Comment

JAR-P 390 ( c )

The use of similarity as proposed in JAR-P 400 (c) should also be provided in JAR-P 390.

(Proposed new para (c):)

"(c) An analysis based on tests of Propellers of similar design may be used in place of the tests of JAR-P 390."

Response

Carried. Text will be adapted accordingly.

**B1 - SECT C - CS-P 400**

**Para. (a)**

**54 / JAA RST**

Comment

JAR-P 400 (a)

The requirement applies to the Propeller System as it was in JAR-P 390.

(Proposed different text:)

(a) For a Variable-Pitch Propeller [System], except as provided under JAR-P 400 (c), the same Propeller used for the test of JAR-P 390 (b) must complete the functional tests of JAR-P 400 (b) without evidence of failure or malfunction.

Response

Noted. This paragraph is applicable to the propeller.

To be consistent with CS-P 390(b), the paragraph now reads as follows:

(a) For a Variable-Pitch Propell, except as provided under JAR-P 400 (c), the same Propeller System used for the test of JAR-P 390 (b) must complete the functional tests of JAR-P 400 (b) without evidence of failure or malfunction.

**B1 - SECT C - CS-P 410**

**Para. (a)**

**54 / JAA RST**

Comment

JAR-P 410 (a)

The word "transient" should be added to make it clear that the Maximum Propeller Overspeed is not for continuous use.

(Proposed different text:)

(a) When approval of a [transient] Maximum Propeller Over-speed is sought, it must be demonstrated, by test, service experience on similar designs, analysis or combination thereof, that the Propeller is capable of performing 20 runs, each of 30 seconds duration, at the Maximum Propeller Over-speed condition without evidence of failure or malfunction.

Response

Disagreed. This is clarified through the definition of Maximum Propeller Over-speed.

**B1 - SECT C - CS-P 410**

Para. (b)

54 / JAA RST

Comment

JAR-P 410 (b)

The word "transient" should be added to make it clear that the Maximum Propeller Over-torque is not for continuous use.

(Proposed different text:)

(b) When approval of a [transient] Maximum Propeller Over-torque is sought, it must be demonstrated, by test, service experience, analysis or combination thereof, that the Propeller is capable of performing 20 runs, each of 30 seconds duration, at the Maximum Propeller Overtorque condition, without evidence of failure or malfunction.

Response

Disagreed. This is clarified through the definition of Maximum Propeller Over-torque.

**B1 - SECT C - CS-P 430**

Para.

54 / JAA RST

Comment

JAR-P 430

The FAA does not concur with the change introduced to JAR-P 430. This change from NPA P-3 greatly increases the scope of the requirement because it expands the requirement to all propeller components that contain hydraulic pressure. It could be interpreted that an oil filled propeller hub would contain the hydraulic pressure created by the centrifugal loads. It should not be the intent of the requirement to test components such as propeller hubs. The requirement should be limited to those components that could result in hazardous propeller effects. The text originally proposed in NPA-P-3 should remain.

(Proposed different text:)

Propeller components that contain hydraulic pressure and whose structural failure or leakage from a structural failure could cause a major or hazardous propeller effects must demonstrate structural integrity by performing:

Response

Noted. This provision applies to all parts subject to hydraulic pressure. However, the text has been modified to be more consistent with CS-E-640. Failure of the hub is likely to result in hazardous effects.

**B1 - SECT D - CS-P 560**

Para.

54 / JAA RST

Comment

JAR-P 560

The FAA does not concur with the inclusion of JAR-P 560 Flight Functional Tests. It is the opinion of the FAA that this requirement is adequately covered by the requirements contained within parts 23 and 25.

Response

(Interface issue). Deferred. Keep the text as proposed. It is up to the Agency to define its policy. Some day FAR 25/23 might contain these requirements from CS-P. The decision will be to either keep them in CS-P or to move them to CS-25/23.

Para. (b)(1)

54 / JAA RST

Comment

JAR-P 560 (b)(1)

There is no definition of Maximum Permissible Propeller Rotational Speed or Torque.

(Proposed different text:)

"(1) The declared [maximum rotational speed] or [maximum power] are not exceeded under all normal and likely emergency operations."

Response

Noted. Capital letters have not been retained.

Text now reads as follows:

"(1) The declared maximum rotational speed or torque are not exceeded under all normal and likely emergency operations."

**B1 - SECT E - CS-P 650**

Para. (c)

**68 / FAA USA**

Comment

The proposed text changes are shown in bold red. (SEE HARDCOPY)

(A new paragraph (c) is proposed as follows:)

(c) The propeller must have a mechanical low pitch stop to prevent reverse thrust operation.

This category of airplane should not have reversible propellers.

Response

Disagreed. CS-P is not the means to define what is acceptable at aircraft level. It should be noted that Section E has been cancelled and that these specifications are in CS-22.

**B1 - SECT E - CS-P 680**

Para.

**68 / FAA USA**

Comment

The proposed text changes are shown in bold red. (SEE HARDCOPY)

(Proposed different text :)

The vibration load limits of each [ ] hub and blade, and of each primary load-carrying [ ] component [ ], must be determined for all reasonably foreseeable vibration load pattern.

The requirement should be expanded to include composite materials.

Response

Noted. However, this is consistent with JAR-22. It should be noted that Section E has been cancelled and that these specifications are in CS-22.

**B1 - SECT E - CS-P 690**

Para. (a)

**68 / FAA USA**

Comment

The proposed text changes are shown in bold red. ( SEE HARDCOPY)

(Proposed different text:)

(a) Fixed-pitch or ground adjustable Propellers. Fixed -pitch or ground adjustable [ ] Propellers must be subjected to one of the following tests:

The requirement should be expanded to include composite materials.

Response

Noted. However, this is consistent with JAR-22. It should be noted that Section E has been cancelled and that these specifications are in CS-22.

**other**

Para. JAR-P 190

**54 / JAA RST**

Comment

JAR-P 190

Add the requirement proposed below to define the intent of the overhaul period for the propeller and applies it to the entire propeller. Propeller overhaul is not addressed in JAR-P 40 Instructions for continued airworthiness. The proposed requirement should be added to bring together the overhaul period for the propeller with the certification requirements. For example a propeller 110 hour endurance test is not sufficient to establish a 4000 hour overhaul interval for a propeller. Additional test, analysis or service experience on similar parts is needed. This rule is currently in FAR part 35 and has been included in the revised draft FAR part 35 so that you may want to consider adding this to the JAR-P.

(Proposed new paragraph:)

JAR-P 190 Durability

Each part of the propeller must be designed and constructed to minimize the development of any major or hazardous propeller effects between overhaul periods.

Response

Disagreed. This has been subject of discussion as part of the harmonisation of propeller rules. The proposed provision coming from FAR Part 35.19 was not felt necessary. The word "minimised" conflicts with CS-P-150 (safety analysis) which quantifies the acceptable occurrence rates.